

Case report

Streptococcus pneumoniae keratitis, a case report

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Infectious keratitis is a common disease of the cornea that is potentially blinding. We report a case of microbial keratitis caused by *Streptococcus pneumoniae* in a man with a one-week history of ocular pain, photophobia, redness and blurred vision. Laboratory evidence of infective agent in a corneal sample is recommended in severe cases for a correct diagnosis and treatment.

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■ Infectious keratitis is a frequent corneal pathology in the ophthalmology emergency services. In most of the cases, an epithelial defect makes infection more accessible for germs.

The microorganisms that are most frequently accountable for these clinical diagnoses are pseudomonas and staphylococcus; and in the developing countries, the most frequent cause is streptococcus.

CASE REPORT

A male patient went to the emergency room with pain, reddening and decrease of visual acuity after an evolution of one week. He previously visited his General Practitioner, who diagnosed acute conjunctivitis, and prescribed tobramycin and dexamethasone. He had neither a systemic history of relevance nor allergy to drugs. He had undergone cataract surgery in both eyes 4 years before.

In the examination carried out in the emergency room he showed a visual acuity in the right eye of 0.16, which improved with pinhole by 0.2, and of 0.9 in the left eye. The bio-microscopy of the former segment showed a moderate ciliary hyperaemia, more intense in the superior temporal quadrant, a white corneal lesion, infiltrated with a perilesional oedema measuring 4x4.5mm, remains of nylon

suture and corneal thinning of 70%. It showed a good anterior chamber and scored a 4+ Tyndall effect. (fig. 1)

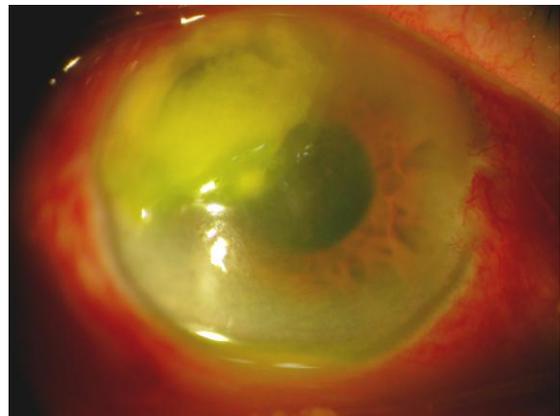


Figure 1. Abscess with corneal thinning of 70%.

Samples were taken by means of the corneal abscess scrape for their culture in agar, blood, chocolate agar, Sabouraud agar and thioglycolate. Suture remains removed from the abscess and the conjunctival exudate were also grown in thioglycolate culture.



Figure 2. Hipopion for 48 hours starting treatment

While waiting for the culture results, the provisional patient's diagnosis yielded a corneal abscess secondary to corneal suture without classification.

A treatment with eyedrops based on reinforced Vancomycin (50mg/ml), and on Ceftazidime (50mg/ml) was immediately started and was alternated every hour without interruption at night for the first day; and then, cyclopegic eyedrops every eight hours were prescribed.

The patient kept having an intense pain, without signs of improvement and hypopyon occurred within the following 48 hours. In view of the worsening of the condition, it was agreed to add oral and external-use Voriconazole to the treatment at the suspicion of facing a mycotic onset (fig. 2).



Figure 3. Aspect of the abscess a week to be treated.

The following days the condition improved slowly, the infiltrate and the Tyndall effect went down, hypopyon disappeared and corneal thickness increased. (fig.3). The results of the culture were available on the fifth day, which yielded a *Streptococcus pneumoniae* sensitive to vancomycin, levofloxacin, penicillin, and cefotaxime. Once the results were achieved, the antifungal treatment was withdrawn as well as the ceftazidime, and commercial eyedrops were added to vancomycin until inflammatory signs disappeared. The cornea re-epithelialized, leaving a peripheral corneal leukoma partially thinned. Final visual

acuity amounted to 0.5 in the right eye with a pinhole (fig. 4).

DISCUSSION

Infective keratitis is a corneal affection that can entail serious results for vision [1]. It is a common pathology in ophthalmology emergency services.

On facing a corneal lesion, the ophthalmologist has two objectives: first, to make out if the inflammatory clinical picture is immune or was caused by an infection; and second, and in case of an infection, to try and define the responsible germ.

There are no pathognomonic signs enabling to make an etiological diagnosis, but there are some features that can lead to think of the presence of some microorganism.

The eye's defence mechanisms are the eyelids, tears, ocular microbial flora, the immune system and the whole corneal epithelium [2].

The factors that enhance the appearance of infections in the cornea are surgical and non-surgical ocular trauma, dry eye, chronic corneal disease, eye adnexes, immune alterations and contact lenses [2,3].

In senior patients, the most frequent cause usually is a previous surgery [3].

In those cases where there is evidence for some kind of infection, no laboratory studies are needed and the treatment will be initiated in an empirical way.

In our case, we decided to take corneal culture samples of conjunctival exudates, and along with the removed nylon, we referred everything to the microbiology service because the patient had an abscess several days' long, the lesion was quite large and had been treated with corticoids that may have concealed any clinical picture.

The microorganisms are most of the times accountable for these clinical diagnoses are pseudomonas and staphylococcus. In developing countries streptococcus is more frequent; in the Western world it is linked to infections of the lachrymal sac or of conjunctival blistering [2].

Once the sample taking was done, the empirical treatment with reinforced broad-spectrum antibiotics was started. Some authors maintain the usefulness of giving antibiotics subconjunctivally, but Baum and col. state that reinforced topical antibiotics have the same or greater efficiency than subconjunctival ones and the risk of side effects is lower.

The non-improvement and the appearance of a serious inflammatory reaction in the anterior chamber advised

initiating oral and topical antifungal treatments because, as the patient lived in a rural environment, it was possible that the triggering factor may not be the corneal point but rather a trauma with some kind of vegetable.

The result of the culture, streptococcus, confirmed the first hypothesis that it was a bacterial side infection to the chronic epithelial damage as a result of suture stitch tearing and corticoid administration.



Figure 4. Corneal Leucoma after resolution of the case.

Nevertheless, it is not always possible to show what was the causal agent. In a survey carried out by Dahlgren [4] and collaborators concluded that the ophthalmologist can identify in most of the cases pseudomone as a causal agent of bacterial keratitis, as they are usually quite large abscesses evolving quickly, but it is more difficult to manage the identification of the rest of the bacteria without the help of cultures.

Listeria monocitogenes, *Corynebacterium*, *Haemophilus aegyptius* and *Neisseria gonorrhoeae* are four pathogens that may bring about a stromal affection without epithelial damage [2].

Streptococcus is the most frequent cause of corneal abscess in the developing countries, but as it happens with most bacteria, it relies on an epithelial defect to get stuck to the epithelium and thus trigger the infection.

The protein of the streptococcus, pneumolysin and O-streptolysin, activate the complement cascade, which causes a serious inflammation. This bacterium can also trigger a kind of keratitis with a less relevant inflammatory reaction. It is thought that the streptococcus polysaccharide capsule, a factor known as virulence, eases the infection progression as it interferes with the alternative way of the complement cascade, leading to the union of C3b factor with H factor and inhibits the said chain. Matoba and his collaborators deem that the capsule of the streptococcus can play an important role in the evolution of clinical pictures such as crystalline keratitis, which brings on a lower inflammatory reaction [1].

Therefore, it is right to suspect the presence of streptococcus in cases of corneal affection with a lower inflammation.

The treatment of a corneal abscess is started with reinforced topical antibiotics such as Vancomycin, Cefazidime or Tobramycin; in some cases the use of commercial quinolones can be just enough.

Predictive factors for failure in this initial treatment are medium-size or large ulcers, negative cultures, hypopyon, lessened visual acuity and senior patients [5].

Corneal perforation is the most serious complication of this diagnosis; but the most frequent after-effects are corneal leukoma; depending where the said leukoma is found, it is accountable for low vision once the clinical diagnosis has been solved. After some reasonable time, a corneal transplant will enable better visual acuity.

CONCLUSION

Clinical exploration cannot just be the sole basis to decide on the treatment of an infectious ulcer. Starting an empirical treatment without sample taking can delay a correct diagnosis. The identification of the microorganism with cultures enables a customised treatment.

Despite the quick modern diagnosis techniques as the PCR (Polymerase Chain Reaction), in the case of bacterial infections the bacterial cultures remain the gold-standard technique. They not only permit to determine the causal agent but also determine the antibiogram [2]. ■

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